



NTSB National Transportation Safety Board

Loss of Control – Is This Really a Big Deal?

*Single Pilot Safety Standdown
NBAA Annual Conv., Las Vegas
November 16, 2015*

Earl F. Weener, Ph.D.
Member, NTSB

N6529R - B36TC Bonanza



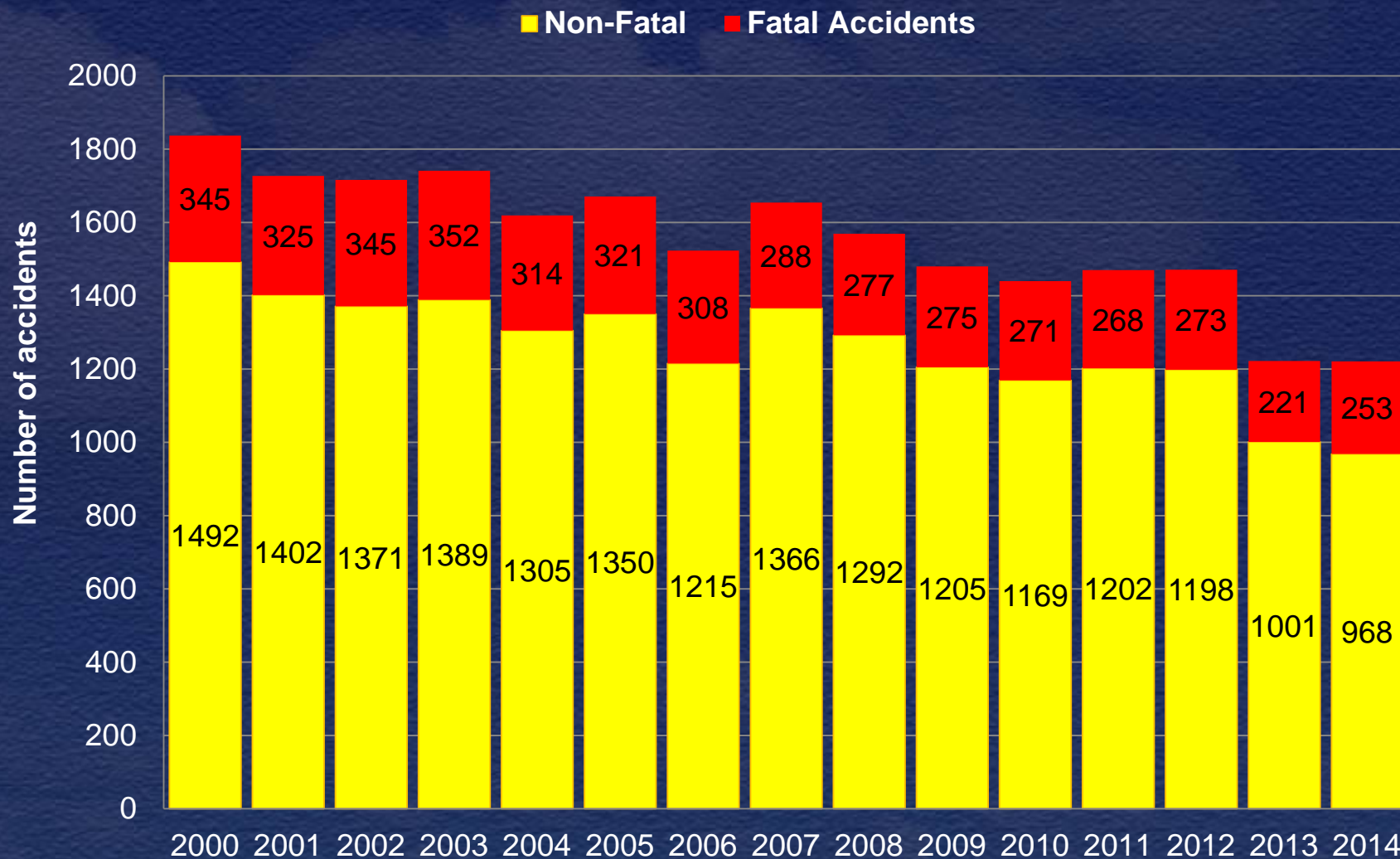
NTSB Mission

The NTSB is an independent US federal agency charged with determining the probable cause(s) of transportation accidents, making recommendations to prevent their recurrence, conducting special studies and investigations, and coordinating resources to assist victims and their families after an accident.

Topics

- General Aviation Accident Trends
- Most Wanted List – Loss of Control
- Loss of Control – In-Flight Breakup
- Loss of Control – Stall/Spin

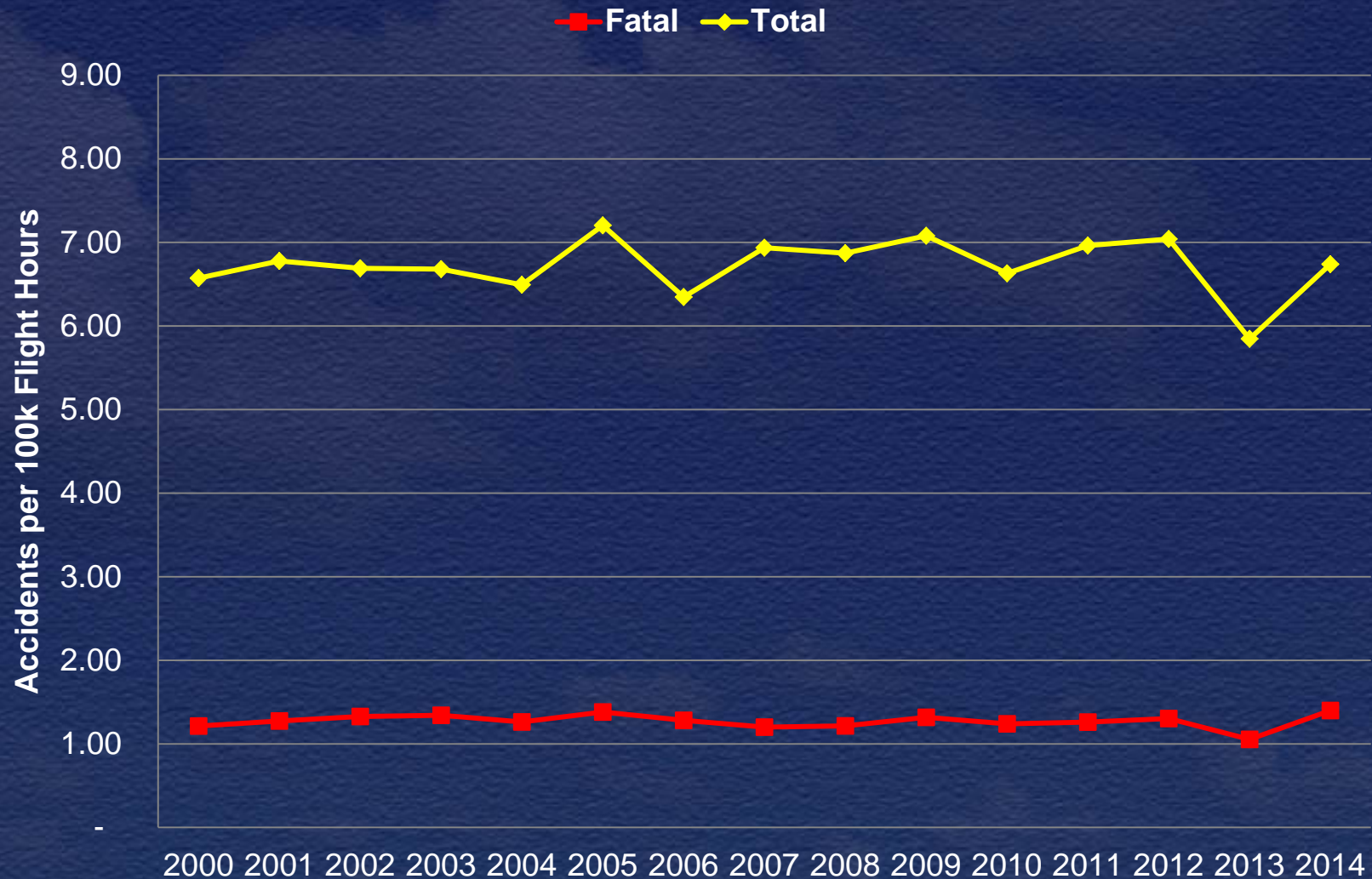
All GA Accidents



GA Accident-involved Fatalities



GA Accident Rates

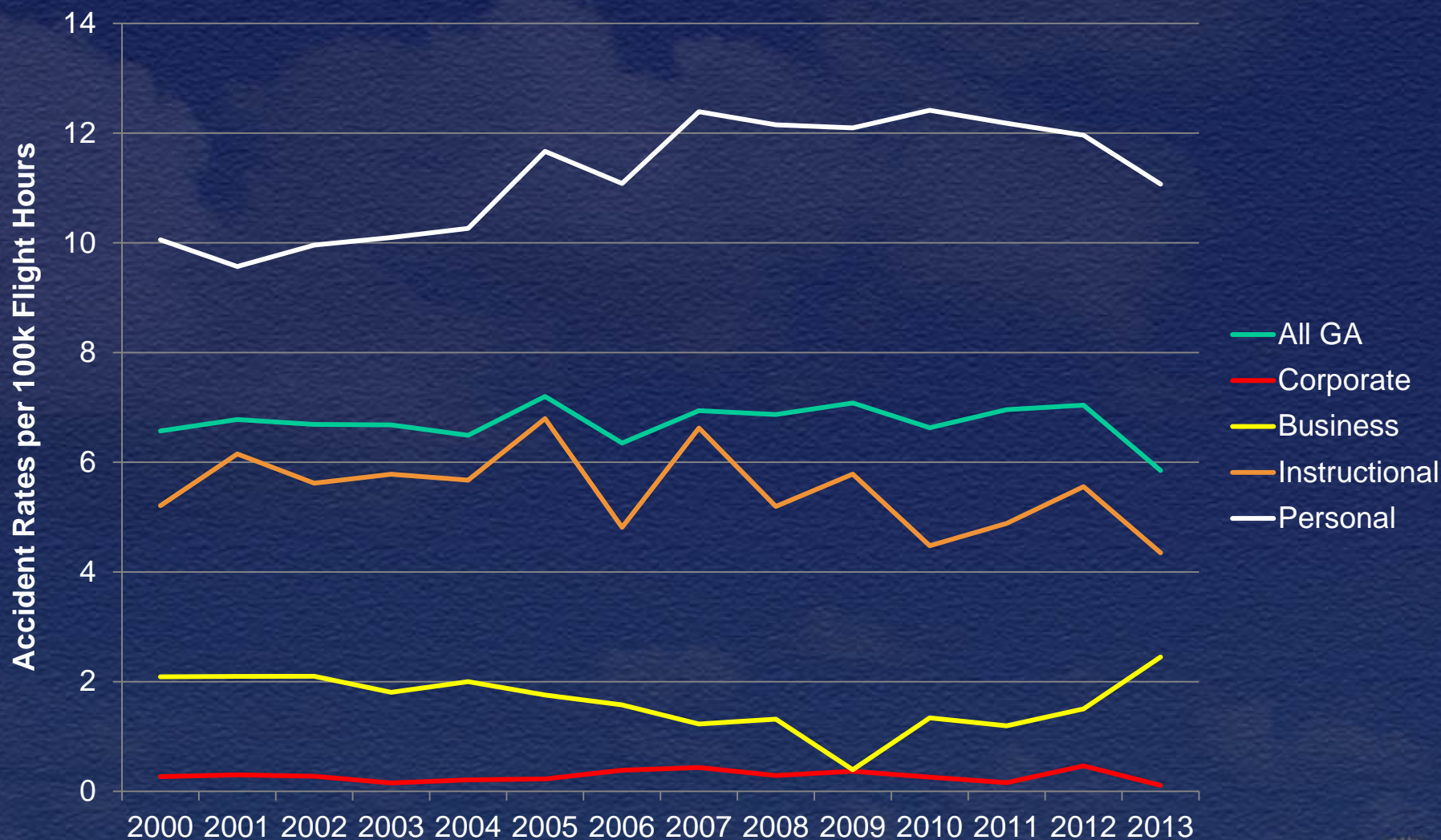


*The 2011 GA Survey is currently not available. FAA is actively engaged in re-calibration efforts and expect to have validated 2011 data published at a later date.

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Accident Rates per 100k Flight Hours

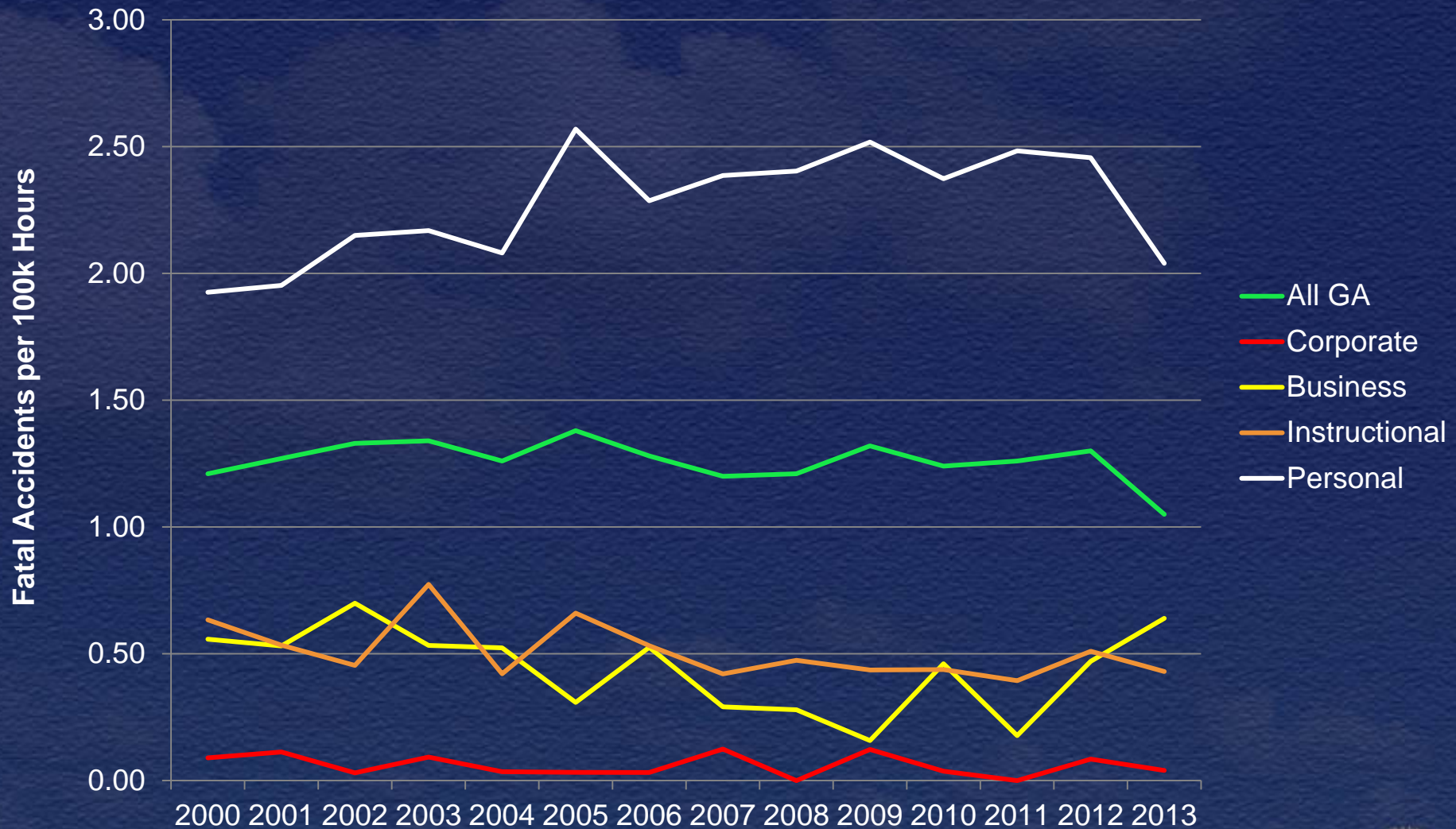


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Fatal Accident Rates per 100k Flight Hours



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Defining Events – Part 91 Ops

Business

1. Loss of Control
2. CFIT
3. Fuel
4. Component Fail
5. Powerplant Fail

Instruction

1. Loss of Control
2. Midair
3. Powerplant Fail
4. CFIT
5. Other

Personal

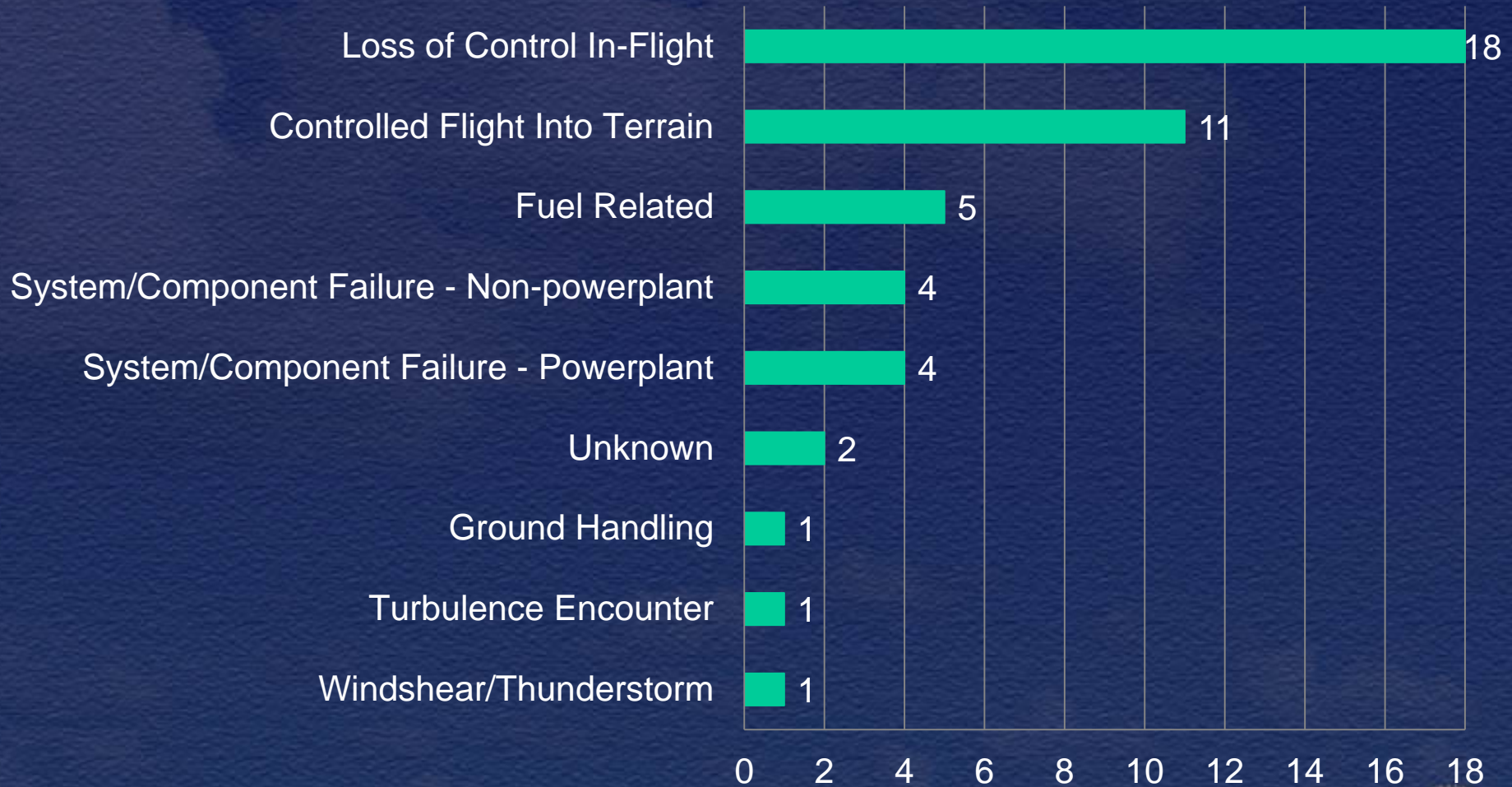
1. Loss of Control
2. Powerplant Fail
3. CFIT
4. Other
5. Component Fail

2015 MWL – Loss of Control

- *Prevent Loss of Control in Flight in General Aviation*
- More than 40% of fatal GA accidents were LOC during 2004 – 2014
- Most deadly flight phases
 - Approach to landing
 - Maneuvering
 - Climb

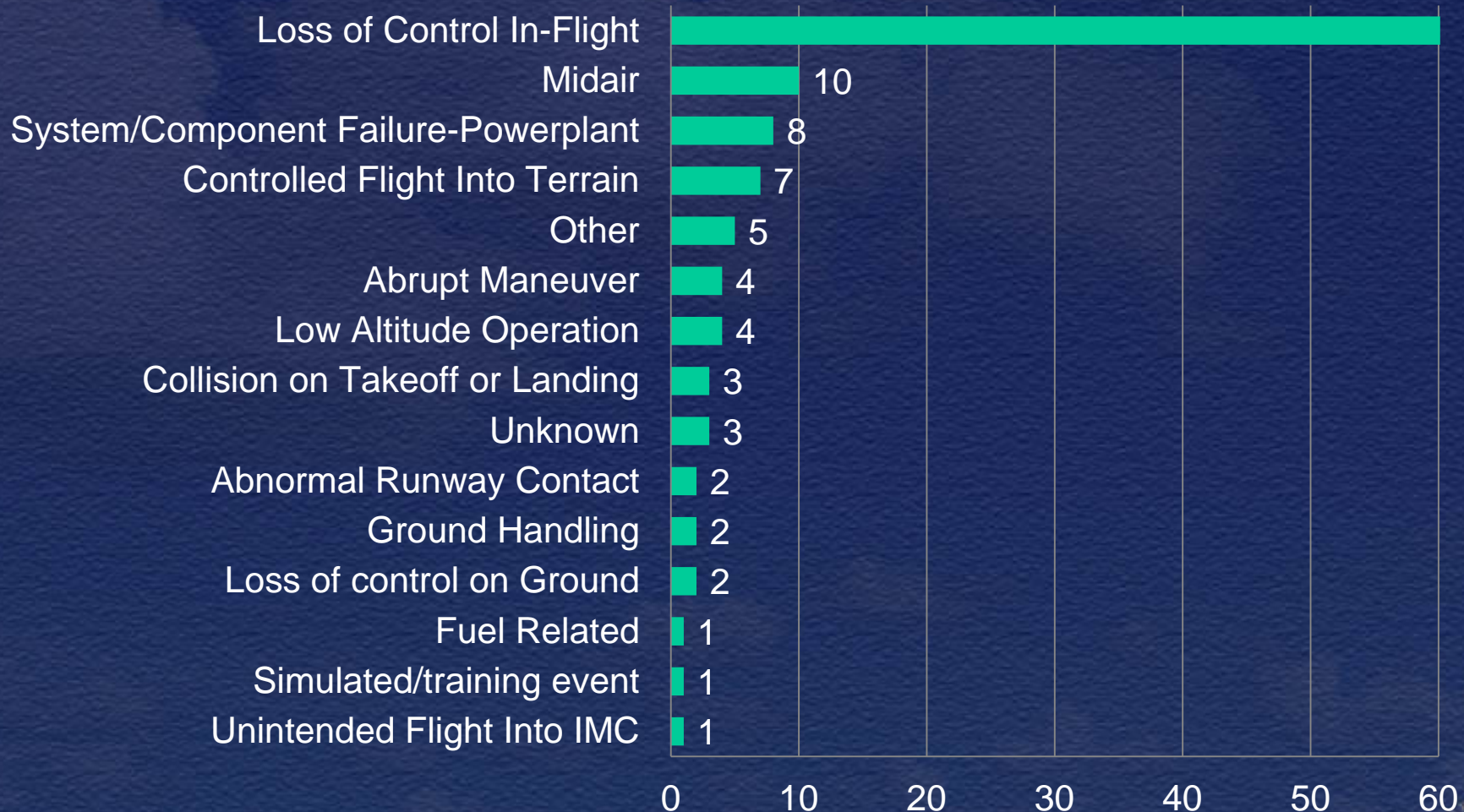
Business Flying, 2008-2014

Number of Fatal Accidents



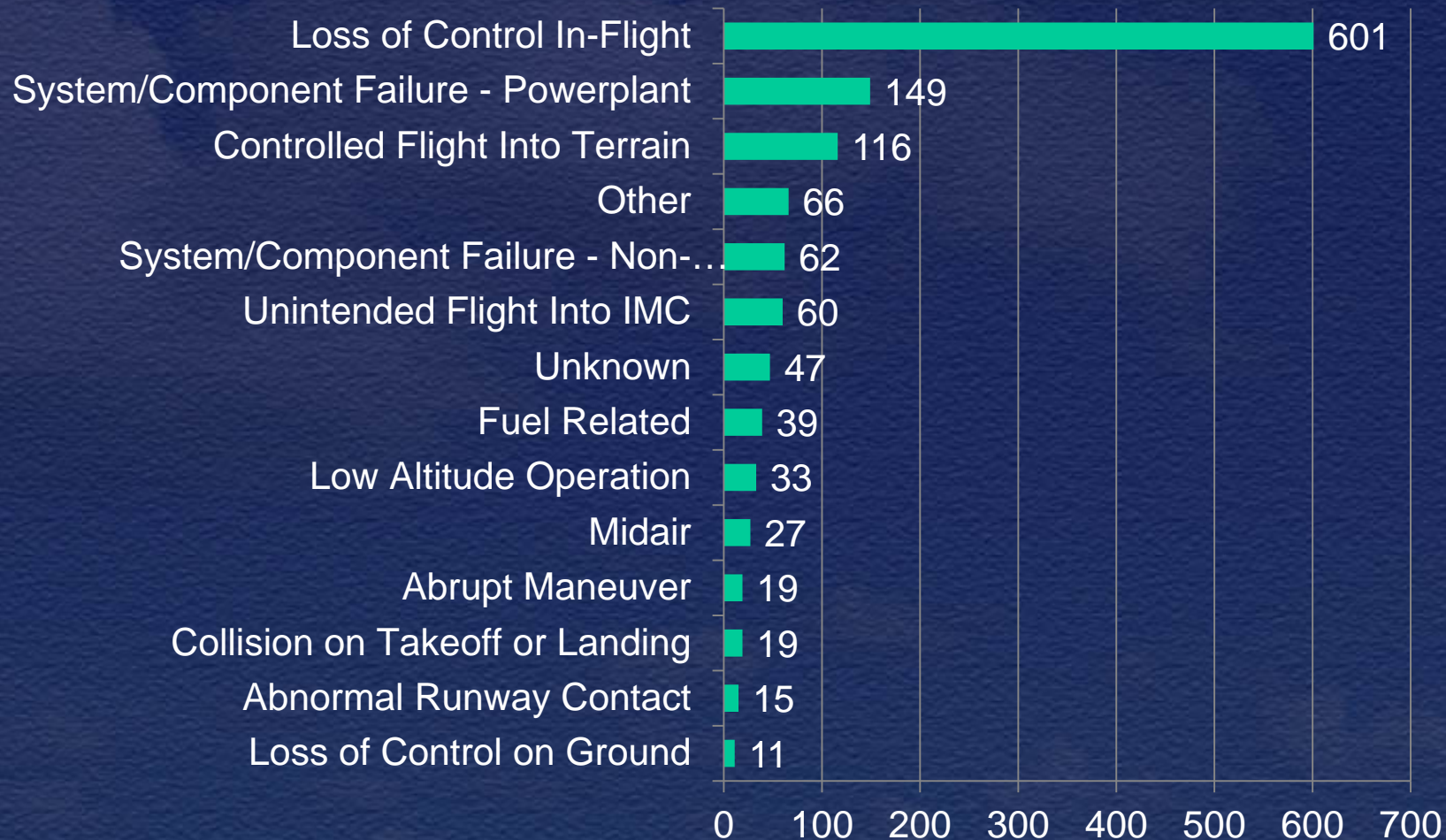
Instructional Flying, 2008-2014

Number of Fatal Accidents

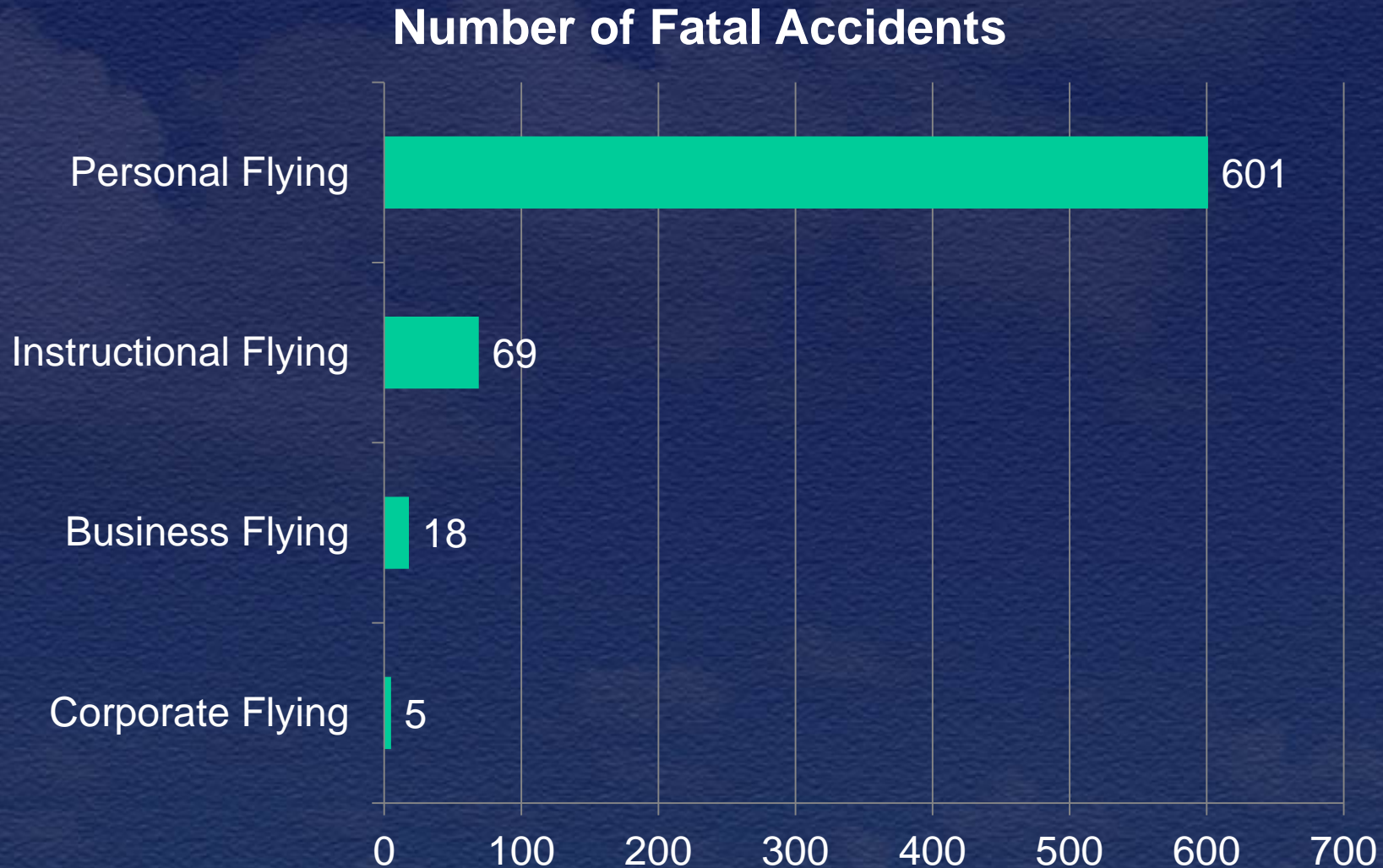


Personal Flying, 2008-2014

Number of Fatal Accidents



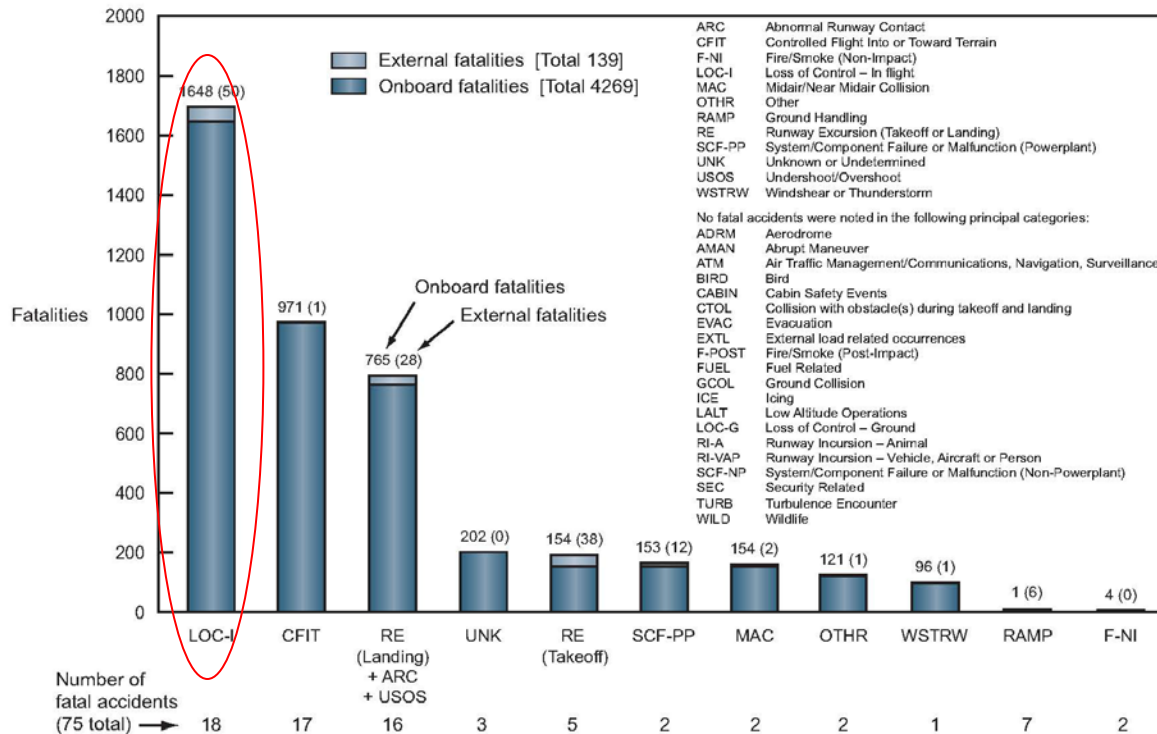
Loss of Control In-Flight, 2008-2014



Boeing Annual Statistical Summery

Fatalities by CAST/ICAO Common Taxonomy Team (CICTT) Aviation Occurrence Categories

Fatal Accidents – Worldwide Commercial Jet Fleet – 2003 Through 2012



Note: Principal categories as assigned by CAST.

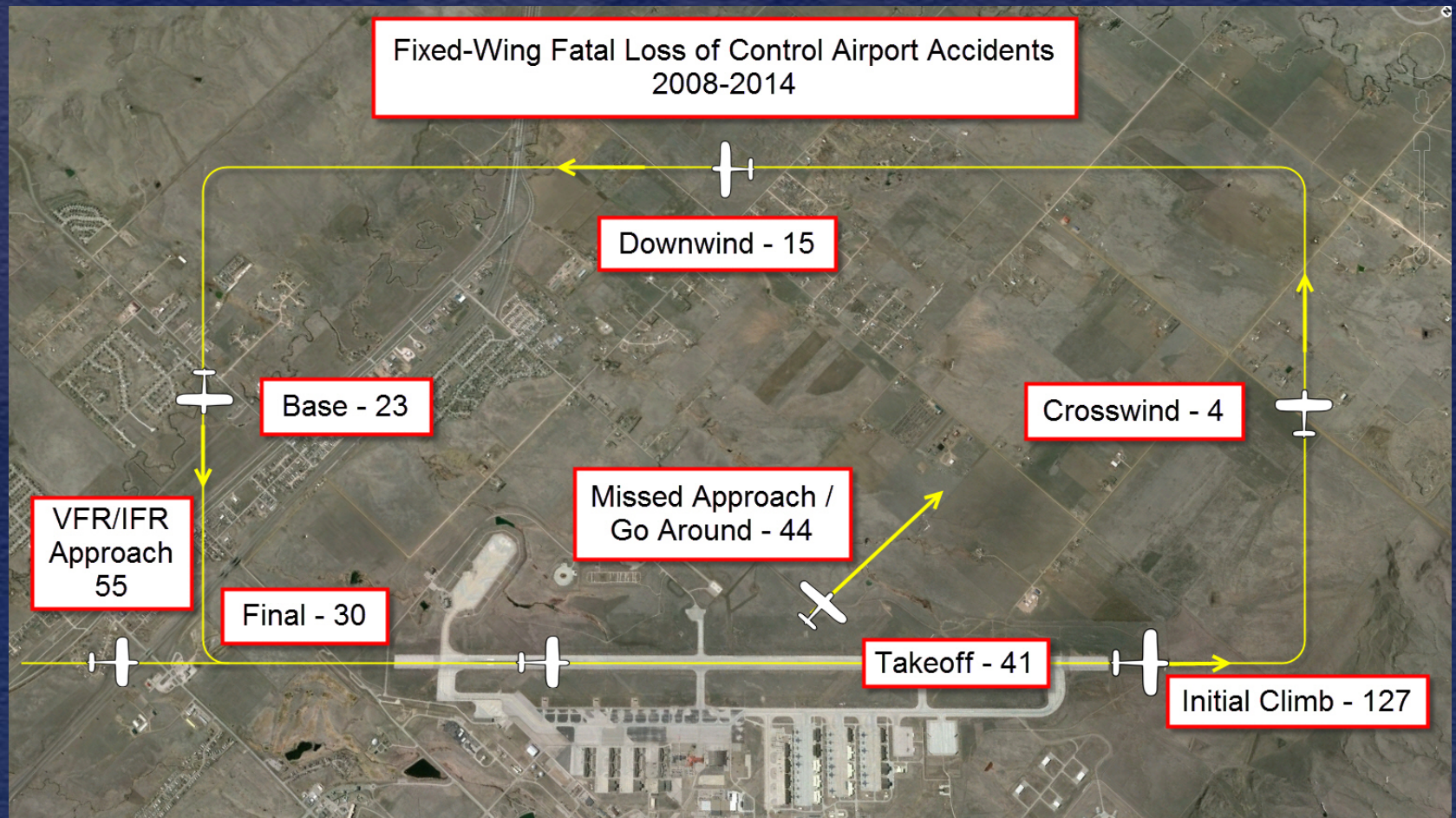
For a complete description of CICTT Aviation Occurrence Categories, go to: <http://www.intlaviationstandards.org/>



Primary category of accidents

Personal flying	– LOC
Instructional flying	– LOC
Business flying	– LOC
Corporate flying	– LOC
Airline flying	– LOC

Fatal Airport LOC 2008-2014



Accident ID: ERA12FA385

14 CFR Part 91

Approximately 1235 EDT, June 7, 2012

Injuries: 6 Fatal

In-flight breakup
near Lake Wales, FL



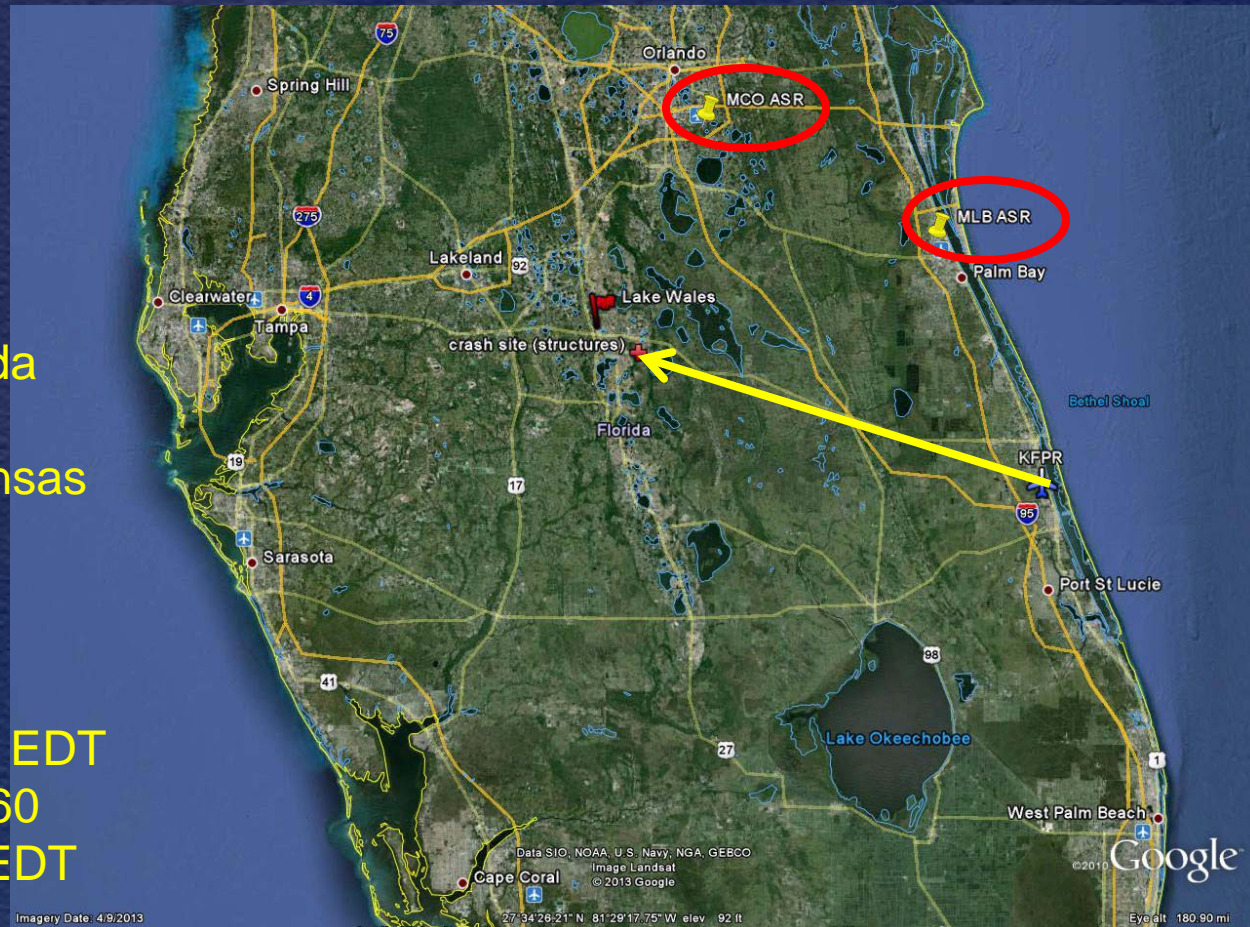
Pilatus PC-12/47, N950KA

History of Flight

IFR Flight Plan

Fort Pierce, Florida
to
Junction City, Kansas

Departure 12:05 EDT
Climbing to FL260
Accident 12:35 EDT



History of Flight

Pilot advised of moderate to heavy precipitation at 12 to 2 o'clock

Deviations north of course approved

Also approved deviations south of course



Weather – no record of briefing

GEOS-13 visible image showed multiple layers of clouds at time of accident

History of Flight

Cleared to FL260

On autopilot throughout climb

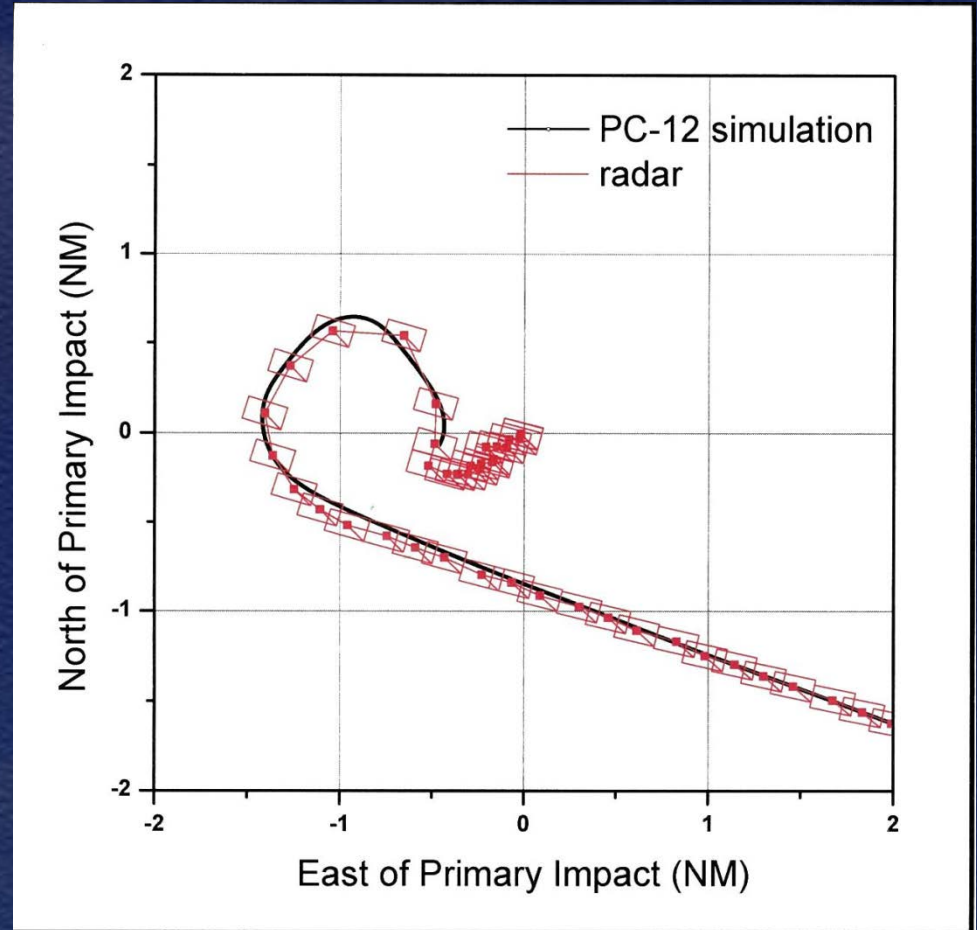
Pirep nearby – light rime FL260

At FL247 activated Ice Mode

At FL251 in IMC right turn on autopilot

Four sec into turn at
IAS 109 kt and
<25 degree bank –
autopilot disconnected

Bank angle increased to approx
100 deg and 338 kt airspeed



Right Forward Quarter



Left Rear Quarter



Left Forward Quarter



Right Forward Quarter



Airplane

- Pilatus PC-12/47
 - Type Certificate December 2005
 - Normal category (load factors +3.3/-1.32 g's)
 - S/N 730, manufactured 2006
 - Max T/O weight 10,450 lbs
 - Maneuvering speed 163 KIAS
 - Vmo 236 KIAS (Mmo .48 Mach)
 - Vd 290 Kias

Pilot

- Age 45
- Private Pilot ASEL, Instrument rating
- Approximately 800 hrs total, 30 hrs instruments
- Prior to purchase
 - No actual instrument time logged in previous 7yr and 4 mo
 - 7.5 hrs dual in PA-46-500TP (Meridian) in 2009 (no endorsement)
- Subsequent to purchase
 - Ground, simulator and extra flight sessions
 - IPC, BFR, High Altitude Flight Endorsement
- 14 hrs PIC in accident airplane

Probable Cause

- The failure of the pilot to maintain control of the airplane while climbing to cruise altitude in instrument meteorological conditions (IMC) following disconnect of the autopilot. The reason for the autopilot disconnect could not be determined during postaccident testing. Contributing to the accident was the pilots lack of experience in high-performance, turbo-propeller airplanes and in IMC.

Accident ID: ERA12FA120

14CFR Part 91

1725 EDT, December 22nd, 2012

One fatality - Pilot

IFR - Long Beach, CA to
York Airport, Nashville, PA

Night visual approach
Engine-out Loss of Control



Cessna 441, N48BS

Arrival Flight Path

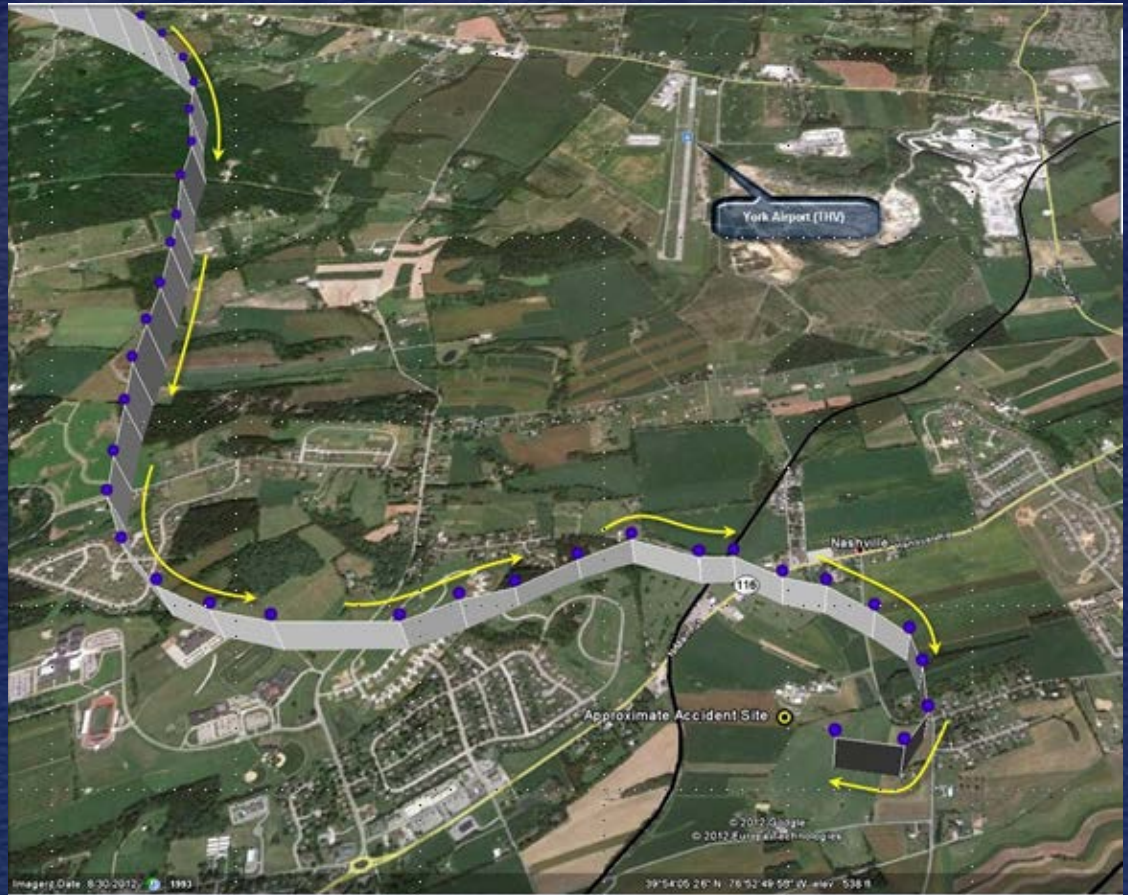
Left downwind

Lost right engine on base leg

Started turn to final

Crossed
extended runway
centerline

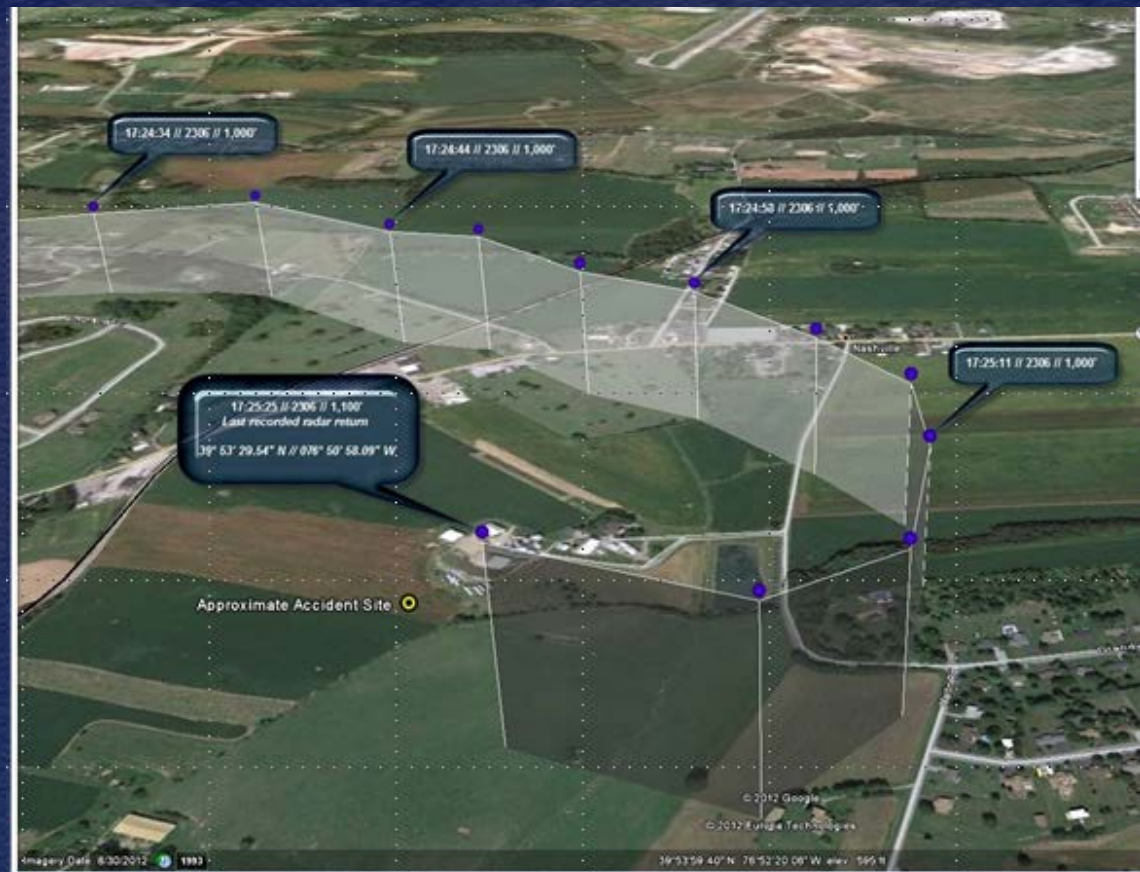
Turned to right



Right Engine Loss of Thrust

Pilot called
“base to final”

Turn continued
into right engine



Witness – bank increased through vertical to inverted
Impacting in near vertical descent

Radar Plot Position and Altitude

Radar plotting

112 kt downwind

102 kt
beginning
base

75 kt in right turn

Maintained
1,100 to 1,200
ft altitude



Witness – “awfully slow”,
“snap rolling nose down,
tail up”

Frontal View



Right Side View



Aft Section View



Left Side View



Pilot

- Age 38
- Commercial License, SEL, MEL, Instruments
- Approximately 1400 hrs Total Time
 - 950 hrs multi-engine
 - Approximately 500 hrs make and model
- Medical – 3rd Class, November 7, 2011
- No medical or toxicological anomalies noted
- Fatality due to “blunt impact”

Airplane

- Cessna 441, Conquest II
- Honeywell TPE 331, 635 HP TP
- Approximately 5900 Hrs total time
- 514 Hrs since engine overhaul
- Right engine loss-of-power
 - Unknown cause
 - Fuel not an issue

Loss of Thrust – Single Engine

- Minimum Control Speed (Vmca) 91 KIAS
- Normal Procedures: Before Landing
 - 13. Wing Flaps – LAND below 180 knots
 - 14. Approach Speed – 99 KIAS at 9360 pounds
- Emergency Procedures (Amplified Procedures)
 - Engine Failure in Flight (Speed Below Vmca)
(Memory Items)
 - 1. Power Lever – RETARD as required to stop turn
 - 2. Aileron and Rudder – AS REQUIRED toward operative engine to maintain straight-ahead flight
 - Pitch Attitude – LOWER NOSE to accelerate above 91 knots

Probable Cause

- The pilot's failure to maintain minimum control airspeed after a loss of power to the right engine, which resulted in an uncontrollable roll into an inadvertent stall/spin. Contributing to the accident was the failure of the airplane's right engine for reasons that could not be determined because no preexisting mechanical anomalies were found, and the pilot's subsequent turn toward that inoperative engine while maintaining altitude.

Beech B100, N729MS



N729MS

Probable Cause

The pilot's failure to avoid severe weather, and the air traffic controller's failure to provide adverse weather avoidance assistance, as required by FAA directives, both of which led to the airplane's encounter with a severe thunderstorm and the subsequent loss of control and inflight breakup of the airplane.

Cessna 421C, N421W



Photo 3 - Main Wreckage

Probable Cause

The pilot's failure to maintain airplane control during descent while operating in instrument meteorological conditions.

Rockwell Int'l 690B, N13622



- Probable Cause
 - The pilot's failure to maintain airspeed while banking aggressively in and out of clouds for landing in gusty tailwind conditions, which resulted in an aerodynamic stall and uncontrolled descent.

Alfred Sheinwold

“Learn all you can from the mistakes of others. You won’t have time to make them all yourself”

Accident Investigations



- NTSB accident files are on-line
- Many recent accident Dockets are on-line
 - Factual reports,
 - Interviews
 - Photographs
- www.nts.gov

<http://www.nts.gov/doclib/reports/2011/ARA1101.pdf>

LOC Forum - Docket

- October 14, 2015 Forum
 - Humans and Hardware: Preventing General Aviation Inflight Loss of Control
- Home>News & Events>Press Releases>NTSB Docket, Video Available for “Humans and Hardware: Preventing General Aviation Inflight Loss of Control”
- Docket - 38 documents and links to video archive & NTSB Youtube Channel
 - Video: Search “NTSB Youtube Loss of Control”
 - Docket: NTSB ID: DCA15SS004

Douglas Adams

“Human beings, who are almost unique in having ability to learn from the experience of others, are also remarkable for their apparent disinclination to do so.”



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